

SPF - skin protection factor
SSHP - site-specific safety and health plan
TEDE - total equivalent dose exposure
TLV - threshold limit value
TWA - time-weighted average
UDC - USACE Command Diving Coordinator
UL - Underwriters Laboratory
USACE - US Army Corps of Engineers
USCG - US Coast Guard

INDEX

-A-

Abrasive blasting	76, 591
equipment	225
media	75
Absorbed dose	91
Access	25, 228, 330, 377, 426, 439, 449
roads	378
Accident prevention	
piping	101
plan	2, 11, 29, 36, 38, 61, 87, 479, 577
signals	101
signs, tags, labels	101, 103
Accidents	8, 10
Activity hazard analysis - see hazard analysis	
Aerial lift	188, 195, 421
Air-purifying respirator	44
Aircraft	317
Airfield operations	573
Alarm systems	41
All terrain vehicles	316
Alternating current dielectric test	46
Altitude dive tables	661
Antimony	153
Arc welding and cutting	158
cables and connectors	159
Arsenic	153
Asbestos	61, 423
Assured equipment grounding conductor program	173, 603
Attachment plugs and receptacles	166
Automatically darkening lenses	34
Automatic feeding devices	221
Automatic fire detection device	146

-B-

Backup alarms	310
Barium	153
Batteries and battery charging	178

Beryllium	153
Blasting	523
air blast pressure	532
black powder	527
blasting machines	525
circuits	475
detonating cord	525, 536
detonators	525
drilling	534
electric blasting machines	524
electromagnetic radiation	531
energy ratios	532
explosives	475, 523
explosives, handling	530
explosives, storage	527
explosives, transportation	528
firing	524, 539
lightning	524
loading	524, 534
misfires	541
peak particle velocities	532
post-blast procedures	541
safety plan	523
scaled distances	532
static electrical discharges	524
underground	476, 465
underwater blasting	542
vibration and damage control	532
warning signs	524
wiring	525, 537
Blood-borne pathogen program	20
Body belt/harness systems	45, 361, 375, 379
Boiler and Pressure Vessel Code	337, 344
Boilers	344
Boom - see cranes and derricks	
Brush chippers.	564
Brush removal and chipping	563
Burning operations.	118

-C-

Cadmium	153
Cage boom guards	177
Caissons - see underground construction	
Carbon monoxide	133
Carbon tetrachloride	136
Cardiopulmonary resuscitation	22, 546
Caution signs	36
Cement	20
Chain	237
Chain saws	225
Change rooms	17
Chemical agent	38
Chopping tools.	569
Christmas tree lifting	236
Chromium	153
Circuit breaker.	172
Classified locations - see hazardous (classified) locations	
Cobalt	153
Code for Unfired Pressure Vessels	341
Cofferdams	444
Cold weather clothing requirements	88
Combustible liquid	147
Command	11
Communication facilities	200
Compressed air	340, 476
blasting	477
work/work plan	474
Compressed gas	341
cylinders	345
Compressed gaseous oxygen, liquid air, or liquid oxygen	40
Compressors	41
Concrete work	479
Confined space	44, 76, 92, see permit-required confined space
Construction areas	103
Contact lenses	40
Contract diving operations	545
air compressor systems	555

altitude dive tables	546
bell	552
breathing air supply hoses.	556
briefing	548
decompression sickness/pulmonary barotrauma	549
dive log	549
dive operations plan	547
dive teams	669
divers	327
emergency and first aid equipment	557
equipment	554
mixed-gas diving	553
power tools	557
pre-dive Conference	548
safe practices manual	546
SCUBA diving operations	550
surface supplied air	545
surface supplied air operations	551
Control of hazardous energy - see hazardous energy	
Controlled load lowering	373
Conveyors	299
Copper	153
Cranes and derricks	258, 625
anti-two block (upper limit) device	269, 291, 293, 372
boom, angle/radius indicator	269, 274, 372
boom, assembly and disassembly.	271
boom, free-fall	373
boom, hoist disengaging device	271
boom, stops	270, 644
communication	263
crawler-, truck-, wheel-, and ringer-mounted cranes	268
critical lifts	267, 293
derricks	279
design and construction standards	262
drum rotation indicators	269
duty cycle	294
environmental considerations	268, 277
floating	275
gantry	278

helicopter	280
inspection criteria	625
inspections, frequent	264
jibs	271
lift supervisor	267
load indicating device	269
load moment indicator	269
load performance test	265, 295
load rating chart	258
luffing jib cranes	274
mobile	199
monorails	279
on-rubber rating	272
operators	260, 267
operational performance test	265, 296
operators, examination and qualification	260, 621
operators, training	261
outriggers.	272
overhead	278
performance tests	265, 296
periodic inspections	264
pillar	273
portal	273
standby	265
tandem/ tailing crane lifts	268
testing requirements	633
tower (hammerhead)	274
underhung	279
weathervaning	274
Cumulative trauma prevention	91
Cutting, arc and gas	151, 154

-D-

D-rings	45
Debris nets	47, 363
Decelerating device	53
Demolition	423
engineering survey	423
mechanical	430
plan	423, 425

Derricks - see cranes and derricks	
Detonating cord	536
Diesel fuel	468
Disconnects	168
Diving	327
see contract diving operations	
Dose Limits	65
Dosimetry	66
Double insulation	169
Dredging	333
hopper dredges	335
pipeline	333
Drilling equipment	289
Drilling machines	469
pressure sensing devices	292
Drinking water	13, 87
Dump trucks	309, 312
Dust	292, 379

-E-

Electrical	151, 163
conductors	384
conductors, overhead	175
conductors, stringing	190
electrical protective equipment	48
isolation	163
overload protection	168
substations	198
storms	194, 291
temporary wiring and lighting	173
underground electrical installations	197
Electromagnetic	71, 199
Elevating work platform	394, 409, 420
Emergency	
descent devices	384
lighting and power systems	323
medical technician	22, 23
operations	501, 583
planning	10, 322
response	59, 517, 520

S-6

Enclosed spaces	152, 218, 250
Engineering/administrative controls	35, 39, 57, 58, 75
Environmental monitoring	87, 90
Epoxy resins	20
Excavations	435, 574
Class I perimeter protection	439, 445
Class II perimeter protection	439, 445
Class III perimeter protection	439, 446
inspection and testing	435
mobile equipment and motor vehicle precautions	438
protection from falling material	437, 454
protection from water	437
protective systems	436
shield systems	443
sloping and benching	436, 440
trenching	444, 447
Explosive-actuated tools	223
Explosives	475, 523
handling	530
Eye and face protection	30, 90, 225, 567

-F-

Face masks and hoods	34
Facial hair	40
Fall protection	44, 351, 355, 375, 383, 402, 411, 490, 493
warning line systems	494
personal fall arrest systems and positioning devices	44-45, 360-361, 381
safety nets	47, 360, 363
Falling object protective structures	255
Fencing	25, 26, 199
Fire	
alarm systems	142
blankets	138
detection systems	142
extinguishers	130, 136, 253, 310, 312, 457, 467
extinguishers, approved	136
extinguishing, chlorobromomethane	136
extinguishing systems, fixed	141

S-7

fighting equipment	142
fighting organizations, training and drilling	144
lanes	119
patrols	144
prevention and protection	117, 154, 333
prevention and protection plan	466
protection, first response	136
protection, in the construction process	120
protection, standpipe and hose system	139
suppression systems, fixed	140
First aid	19, 20, 22, 63, 546
attendant	21-23
facilities	452
kits	19, 21
station	19-21
Fit testing - see respirators	
Flag and signal persons	104-105
Flammable	
atmosphere	509
gases	463
liquid	148
materials	316
Flammable and combustible liquids	121, 232
portable tanks	122, 123, 148
storage cabinets and areas	124
storage tanks	149
storage, underground	467
Flashlight	29
Flexible cords	164
Floating cranes and derricks - see cranes and derricks	
Floating plant	177, 319
access	330
escape hatches and emergency exits	325
inspection and certification	319
personnel qualifications	320
see dredging and launches, motorboats, and skiffs	
Floor and wall holes and openings	433
Floor removal	429
Fluorine	153
Flying objects, protection against	30

Food service	17
Formwork	481
Fueling	316
Fuses	166
-G-	
Gas metal arc welding	160
Gassy operations	458, 459, 461, 463-465
Generators	
frame grounding - see grounding	
portable and vehicle-mounted	171
Glare-resistant glasses	34
Grinding and abrasive machinery	219
Ground fault circuit interrupter	172, 202
Ground/grounding	169, 171, 186, 201, 219, 182
electrode	169-170
frame grounding	171
protective	211
Guardrails	327, 496
-H-	
Hand protection	29
Hand signals	104
Hand tools	384
Hand-arm vibration	91
Handlamps, portable	167
Handrails	359
Hard hat areas	36
Harmful plants, animals, and insects	62
Haul roads	377
Hazard analysis	3, 5, 11, 29, 36, 38, 51, 57, 59, 76, 190, 257, 262, 273, 276, 289, 321, 351, 368, 383, 474, 490
position hazard analysis	2, 12, 28
Hazard communication	6
Hazardous classifications - see gassy operations and potentially gassy operations	
Hazardous locations	119
Hazardous (classified) locations	179, 202
Hazardous energy, control	205

full personnel protection	214
plan	205, 207, 214
procedures	206
Hazardous materials	151, 155
Hazardous substances, agents, environments	57, 59, 424
Hazardous, toxic, and radioactive waste	499, 653
decontamination	515
drums and containers	511
initial site entry	504
monitoring and sampling	506, 509
shipping and transport	515
site characterization and analysis	504
site control program	502
site-specific safety and health plan	87, 500-502, 509, 515, 518
Head protection	36-37
Hearing	
conservation	35
protection	34-36
Heat/cold stress monitoring plan	87
Heating devices	61, 131
gas	134
LP-Gas	135
natural gas	135
open-flame heating devices	132
positive operating procedure	132
safety data plate	131
Herbicides	16
Hoisting	384
ropes	263
Hooks	241
Hot or molten substances	30, 61
Hot stick distances	183
Hot tapping	156, 161
Hot work permits	61
Housekeeping	230, 283
Hydraulic	
fluid	187, 218
tools	187, 218
Hydrocarbons	20

Hydrogen sulfide	462
Hydrostatic testing	337
-I-	
Immediately dangerous to life or health	42-44, 54, 94, 505-506
Impalement hazards	29
Inclement weather	87
Indoctrination	5, 6
Industrial hygienist	58
Infirmaries	19-22
Insecticides	16
Insects	18, 19
Insulating	
links	177
mats	166
Intrinsically safe	179, 203
Ionizing radiation	63
safety committee	65
warning signs, labels, signals	102
-J-	
Jumbos	470
-L-	
Labels	69
Ladders	187, 364, 383-384, 386-388, 645
jacks	384
Lanyards	45, 54, 361
Lasers	71
caution and danger signs	102
Launches, motorboats, and skiffs	332
Lead	61, 423, 153, 423
Licensed physician	19-23, 38, 238
Licensed physician's assistant	22, 23
Licensed practical nurse	21-23
Lifeline	45, 54, 362
Liferig	50-51
Lifesaving and safety skiffs	51, 375
Lift trucks	252
Lift-slab operations	486

Lifting - see safe lifting	
Lighting	99
Lime	20
Limited access zone	492
Lineman's equipment	46
Liquified petroleum gas (LP-Gas)	127
container valves	128
containers	130
hose	131
multiple container systems	128
safety devices	128
shut-off valves	128
Live boom	380
Live-line bare-hand	49, 54, 183, 194, 203
Lockout and tagout	
devices	185, 206, 209, 210
procedures	299
see hazardous energy	
Long-bed end-dump trailers	258, 296
-M-	
Machinery and mechanized equipment	247
Manganese	153
Manual on Uniform Traffic Control Devices	
for Streets and Highways	104, 379
Marine activities	319
Masonry construction	492
Material	
handling, storage, disposal	227, 232
hoists	283
Material Safety Data Sheets	6, 59, 60, 288, 499
Medical	19
facilities	19
fitness examinations	547
surveillance	71, 75, 500, 653
Medically determined qualified	7, 39
Melting kettles	61
Mercury	153
Methane	463
Miners' lights	29

Motor vehicles	309
----------------	-----

-N-	
National Board of Boiler and Pressure Vessel Inspectors	337
Navigation locks	51, 335
Nickel	153
Noise hazard areas	36
Nominal dimension	26, 380
Non-ionizing radiation	71, 95
Nonmetallic sheathed cable	175
Nonsparking tools	218

-O-	
Occupational Safety and Health Administration	9
Operators	7
Outrigger beams	396
Overcurrent	
device	167
protection	167
Overhead guards	255
Oxyfuel gas	156
cutting	161
welding	162
hose	156
Oxygen cylinders	156
Oxygen deficient atmosphere	43, 54, 95
Oxygen enriched atmosphere	95
Ozone	153

-P-	
Paint barges	124
Paints	16
Permit-required confined space	76, 95
entry procedures	81
program	81
Personal fall protection - see fall protection	
Personal floatation devices	49, 53, 322, 332, 333, 375
lights	50

Personal protective equipment	
clothing	20, 57, 59, 27, 28, 75, 152, 158, 178
footwear	218, 225, 227, 281, 505, 508
see specific type	17
Physical qualifications	28
Physicians - see licensed physician	7
Piledriving	286
Planking	353, 385
Plants, poisonous	20
Platforms	383, 399
Positioning device - see fall protection	
Post-tensioning	479
Potentially gassy operations	458-459, 461, 463-465
Power	
lines - see electrical conductors	
transmission and distribution	182
Precast concrete operations	486
Preparatory inspection	205, 288
Preservative coatings	152
Pressurized equipment and systems	75, 337
Process safety management	60
Project safety and health plan	29, 36
Public	29, 211
-R-	
Radiant energy	34
Radiation	
monitoring	66
safety officer	64
safety program	64, 70
Radio frequency radiation hazard warning symbol	101
Radio/cassette	248
Radioactive Waste Disposal	70
Rail clamps	274
Railing (guardrails and handrails)	357, 368, 383, 403
Ramps	370, 440, 645

Registered nurse	22-23
Reinforcing steel	29
Rescue	84, 86
Reserve signal (back-up) alarm	253
Respirators	38
atmosphere-supplying	42
canister and cartridge type, air-purifying	42
emergency use self-rescuer devices	38
fit testing	38, 39
military protective masks	38
negative-pressure	54
positive-pressure	55
self-contained breathing apparatus	43
supplied air	44
Respiratory protection	38, 68, 152, 153
devices - see respirators	
program	38
Reverse-flow check valve	158
Rigger	259, 267
Rigging	235, 260, 615
drums	242
fiber rope	237
frequent wire rope inspections	264
hardware	240
periodic wire rope inspections	264
slings	240
wire rope	236
Ring buoys	50, 53
Rodents	18
Rollover protective structures (ROPS)	256
Roofing	493
access	495
brackets	494
personal fall arrest systems	496
Rope - see rigging	
Runways	370
-S-	
Safe lifting techniques	227

Safety

belt	55
can	126, 149
control	133
devices	41, 299
equipment	1, 2, 27
harness	55
lashing	222, 225, 340
nets - see fall protection	
skiff	50
tire rack/cage	254, 313
(relief) valves	339
Safety and health program	1, 500, 502
Safety and occupational health office	2, 8, 13
Sampling	154
Sanitary facilities	59
Sanitation	13
Saws - see woodworking machinery	
Scaffolds	134, 383, 485, 490, 492, 581
access.	386
bracket.	405
capacities	384
carpenter's bracket	405
design	385
form	405
horse	407
independent pole scaffolds	393
lean-to and prop-scaffolds	384
manually-operated hoists	398
manually propelled mobile scaffolds.	390
metal.	390
metal frame.	390
pump jack	407
suspended	393
suspended, hoisting machines.	397
suspended, mason's multiple-point adjustable	401
suspended, stonesetters' multiple-point adjustable	401
suspended, support devices	395
suspended, support ropes	394
suspended, support systems	436, 441, 446

suspended, two-point	400
tube and coupler scaffolds	388
wood pole	391
Scaffolds, platforms, or temporary floors	383
Seas	277
Seat belts	255, 313
Selenium	153
Service/refueling/lubrication areas.	127, 136
Severe weather	321
Shackles	241
Shafts - see underground construction	
Sheaves	243
Shoring	481
Showers	16
Signal systems, personnel, procedures	29, 104, 253
see spotter	
Signs	69
Silica	76, 292, 591
Silver	153
Slings - see rigging	
Slip forms	484
Sloping/benching - see excavation	
Slow-moving vehicle emblem	102
Smoke alarms	325
Smoking	117
Soap	16
Solar radiation	90
Solvents	20
Sound-pressure	34-36
Spotter	290, 315
see signal personnel	
Spray guns	222
Sprinkler head	156
Stairways	368, 387, 645
railings	368
Standard guardrails and handrails - see railing	
Static electricity	225
Steel	
erection	479, 488
removal	430

Sun screen	90
Switches.	168
-T-	
Tag lines	266, 400
Tank cars/trucks.	127
Temporary	
building spacing	119
facilities	25
floors	383
heating devices - see heating devices	
lighting.	174
power distribution systems	173
sleeping quarters	26
structures	25
Throw bags	50
Tire service vehicles	252
Toeboards.	359
Toilets	14
Tools.	187
hand	217
pneumatic	187, 222
power	217
see specific type	
Torch valves	157
Torches.	157
Towels	17
Towers - see scaffolds, metal	
erection	190
Towing	251, 315
Toxic or corrosive materials	20, 316
Traffic flagging procedures	29, 104
Trailer anchoring systems	25
Training	5-7, 10, 12, 19, 27, 28, 38, 64, 65, 75, 83, 133, 138, 208, 289, 356, 394, 410-411, 423, 500, 506, 546
Transportation	19, 71
Tree maintenance and removal	561, 673
brush chippers.	566
brush removal	565
cant hooks, cant dogs, tongs, and carrying bars.	570

chopping tools.	569
equipment.	562-563, 567
felling	564
limbing and bucking.	568
power saws.	569
pruning and trimming.	567
tree climbing	563
trucks.	568
wedges and chisels	570
Trenching - see excavations	
Tubing, polyvinyl chloride and aluminum	128
Tunnels	20
see underground construction	
-U-	
Ultraviolet degradation	37
Underground	
installations	435
storage tank removal	510
Underground construction	449, 456
air monitoring requirements.	460
air quality standards.	462
caissons	473, 478
fire prevention and protection	465
ground support systems	455
rescue teams	451
shafts	471
shafts, access	472
shafts, hoisting	472
ventilation.	464
Unexploded ordnance	29, 435
USACE Sign manual.	101
Utilities	424
-V-	
Vanadium	153
Vehicle-mounted elevating and rotating work platforms	410, 422
fire protection	412
Vent pipes	133
Ventilation and exhaust systems	74, 329

Vermin control	18
Vessel	336
Visitors	28

-W-

Wall	
openings - see floor and wall holes and openings	
removal	428
Warning signs	25-26, 72, 524
Washing facilities	16
Waste disposal	18
Welding and cutting	129, 151
pressurized system	151
see specific type	
Wet locations.	174
Wildfire control	145
plan	145
teams and operations	146
Windshields	255
Wire rope - see rigging	
Woodworking	
machinery and saws	220, 569
machinery guarding	605
Work platforms	383
manufactured work platforms	383
Work practice controls	59
Work/warm-up regimen	87